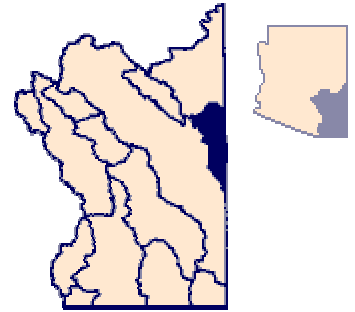


DUNCAN VALLEY BASIN

The Duncan Valley basin is located along the eastern border of Arizona with New Mexico and covers about 550 square miles in Arizona (Figure 17). This area is part of the Basin and Range physiographic province and is made up of an elongated valley surrounded by the Peloncillo Mountains to the west and the Big Lue Mountains to the east. The Gila River runs through the basin from the southeast to the northwest. Elevation varies from 6,571 feet above mean sea level in the Peloncillo Mountains to 3,336 feet above mean sea level at the downstream end of the Gila River.



The Duncan Valley basin is made up of an elongated valley filled with water-bearing sediments and surrounded by generally impermeable rocks. The water-bearing sediments are broken into three units. In descending order they include: the younger alluvial deposits, the Gila Formation, and the older basin-fill (Remick, 1989 after Morrison, 1965).

The younger alluvial deposits, the principal source of groundwater in the basin, consist of gravel and sand generally underlain by clay. The alluvium is found along the Gila River and its tributaries where the thickness varies from one to 170 feet. Many wells also tap the Gila Formation which consists of poorly consolidated sand, silt, and gravel deposits and a fanglomerate zone. The older basin-fill consists of alluvium, tuff and volcanic conglomerate. Only minor amounts of groundwater issue from the basin-fill.

In general, water levels and groundwater movement in the Duncan Valley basin are controlled by the Gila River. Groundwater and surface water generally moves from southeast to northwest across the state line from New Mexico into Arizona. In 1987, depth to water in wells ranged from less than 10 feet below land surface along the Gila River to 600 feet below land surface near the mountains (Remick, 1989). No significant changes in water levels have been observed since 1939 when the first measurements were made in the basin. Using 1939 data, Halpenny and others (1946) estimated underflow from New Mexico to be 7,200 acre-feet per year and recharge from washes to be approximately 7,000 acre-feet per year. Underflow out of the basin was estimated to be 350 acre-feet per year.

In 1985, just over 5,000 acre-feet of groundwater were pumped from the basin (Arizona Department of Water Resources, 1988). Remick (1989) reports well-yields from the younger alluvium ranging from 350 to 2,350 gallons per minute and from the Gila Formation ranging from a few to 200 gallons per minute. Well-yields from the mountains and bedrock are only a few gallons per minute. Approximately 19.0 million acre-feet of groundwater are in storage to a depth of 1,200 feet below land surface (Arizona Department of Water Resources, 1988); groundwater quality generally is good with dissolved solids concentrations ranging from about 100 to 2,150 milligrams per liter (Remick, 1989).